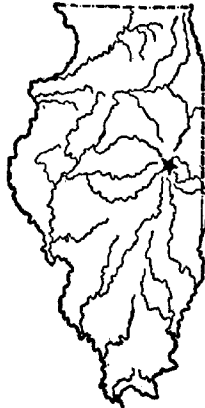


UNIVERSITY OF ILLINOIS
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BULLETIN No. 195

YIELDS OF SPRING GRAINS IN ILLINOIS

By W. L. BURLISON AND O. M. ALLYN



URBANA, ILLINOIS, JANUARY, 1917

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YIELDS OF SPRING GRAINS IN ILLINOIS

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Spring grains constitute a large part of the crops produced in Illinois. Every season, the Illinois Experiment Station is asked to give definite information relative to varieties of oats, barley, and spring wheat for the different sections of the state. This bulletin is intended to present the results of variety trials with these small grains, which have been obtained in the northern, the central, and the southern sections of Illinois, as represented by the experiment fields at DeKalb, in DeKalb county; Urbana, in Champaign county; and Fairfield, in Wayne county.

Illinois possesses marked climatic and soil differences. From north to south, the extreme length of the state is about 380 miles. The rainfall for northern Illinois is 33.64 inches per year; for central Illinois, 35.76 inches per year; and for southern Illinois, 40.25 inches per year. The length of the growing season for the northern section is 166 days, as an average; for the central section, 173 days; and for the southern section, 188 days. Therefore varieties of small grains suited to one locality are not necessarily the most desirable for another part of the state.

The soil on which the experiments at DeKalb and Urbana were conducted is, for the most part, brown silt loam; at Fairfield, gray silt loam on tight clay. These fields have been regularly supplied with phosphate rock and either farm manure or crop residues. Limestone has also been applied at Fairfield and to some extent at Urbana. The aim has been to keep the land in a good state of fertility but not to produce abnormal conditions. It is believed that these fields are such as any progressive Illinois farmer would maintain. Methods of culture which have been followed are comparable with those practiced by leading grain growers of the corn belt. Thus the yields reported are no larger than may well be expected from the respective sections of Illinois. They are calculated on the basis of 32 pounds per bushel.

NORTHERN ILLINOIS

TESTS AT DEKALB, IN DEKALB COUNTY

Variety tests of spring grains were begun on the DeKalb crop field in the spring of 1907. In the main, they have been conducted in the west rotation, consisting primarily of corn, corn, oats, and clover.

Other tests with oats, spring wheat, and barley have been conducted mostly in the east rotation, consisting of corn, oats, wheat, and clover. In each rotation, a grain system and a live-stock system of farming have been practiced, and each variety has been tested in each system of farming each year.

Oats.—In making the comparisons of the different varieties of oats, those varieties grown in the rotation of corn, corn, oats, and clover have been used, as the larger number of varieties have been grown in that rotation.

Since the highest average yield does not always indicate the best variety, and in order to establish more definitely the relation of the

TABLE 1.—AVERAGE YIELDS OF VARIETIES OF OATS GROWN AT DEKALB, AND PERCENTAGE RATING USING SWEDISH SELECT AS A STANDARD: 1907-1916¹
(Bushels per acre)

Variety	1907	1909	1910	1911	1912	1913	1914	1915	1916	Per-centage rating
Swedish Select.....	...	52.9	78.4	50.6	70.0	48.0	47.5	62.8	59.3	100.0
American Banner.....	28.8	...	...	57.1	77.9	61.5	43.3	61.6	65.4	105.3
Schoenen.....	26.6	...	...	55.7	77.2	64.9	47.2	63.8	71.1	112.2
Silvermine.....	32.2	...	...	53.6	76.4	63.8	49.0	78.4	62.6	112.5
Sixty Day.....	37.8	...	...	57.7	62.2	41.1	55.7	...	...	100.4
Danish White.....	30.9	55.3	83.6	...	...	...	...	61.2	61.3	103.2
Irish Victor.....	33.1	53.9	73.3	...	...	...	...	61.6	65.4	100.3
Lincoln.....	27.8	47.4	75.8	...	...	...	...	65.4	63.1	99.2
Minnesota No. 6.....	27.2	46.0	75.0	...	...	...	...	64.6	64.6	98.7
White Bonanza.....	30.2	44.9	73.1	...	...	...	...	...	63.0	95.0
Siberian.....	26.9	...	...	54.7	61.2	63.6	...	...	...	106.4
Twentieth Century.....	33.8	59.1	84.1	...	...	...	...	...	...	109.0
Black Gotham.....	38.4	...	...	55.9	63.0	...	...	...	...	98.7
Silvermine (6-103).....	...	...	...	...	...	...	51.2	71.5	62.8	109.4
Garton's No. 5.....	...	...	...	...	...	...	40.2	31.5	56.6	73.8
Black Tartarian.....	29.7	...	...	...	...	...	...	...	42.0	...
Mammoth Cluster.....	...	...	...	...	...	...	...	47.4	66.4	93.1
Scottish Chief.....	...	...	...	...	...	...	...	76.3	64.1	114.9
Great American.....	...	...	...	...	...	...	...	69.5	72.1	115.9
Big Four.....	...	...	...	...	...	...	...	67.9	63.5	107.5
White Kherson (Iowa 103).....	...	...	...	...	...	...	...	67.6	69.6	112.3
White Russian.....	...	...	...	...	...	...	...	62.8	38.2	82.7
President.....	...	...	...	...	...	...	...	60.9	53.1	93.3
Wisconsin Pedigree No. 1.....	...	...	...	...	...	...	...	59.0	59.6	97.1
Texas Red.....	...	...	...	...	...	...	...	58.1	58.9	95.7
Bryant's Silver Plume.....	...	...	...	...	...	...	...	54.4	61.6	94.9
Victory.....	...	...	...	...	...	...	...	...	57.5	...
Garton's Victor.....	...	...	...	...	...	...	...	...	47.7	...
Hvitling.....	...	...	...	...	...	...	...	...	65.6	...
Early Champion.....	...	...	...	...	...	...	...	...	61.1	...
Yellow Kherson (Iowa 105).....	...	...	...	...	...	...	...	...	60.7	...
Native Yellow.....	...	...	...	...	...	...	...	...	58.9	...

¹The 1903 cutting was mixed in harvesting, and the yields were therefore thrown out.

different varieties with respect to yield, all are compared on the same basis, with Swedish Select as a standard. This at once gives a definite rating of the different varieties when compared with a standard variety, even tho the standard may not be the leading variety.

A summary of the varieties tested at DeKalb from 1907 to 1916 appears in Tables 1 and 2, which present fairly conclusive data as to the highest yielding and most important varieties.

Of the varieties tested for six years, Silvermine, Schoenen, and American Banner have produced the highest yields. Great American, Scottish Chief, and White Kherson (Iowa 103), which have been tested for only two years, have given very satisfactory yields.

TABLE 2.—COMPARABLE AVERAGE YIELDS OF VARIETIES OF OATS GROWN AT DEKALB USING SWEDISH SELECT AS A STANDARD: 1909-1916

(Bushels per acre)

Variety	Total number of tests	Number of years compared	Years on which comparison is based	Average yield
Swedish Select.....	24	6	1911-1916	56.4
American Banner.....	16	6	" "	61.1
Schoenen.....	16	6	" "	63.3
Silvermine.....	16	6	" "	64.0
Swedish Select.....	16	4	1911-1914	54.0
Sixty Day.....	8	4	" "	54.2
Swedish Select.....	16	4	1909, 1910, 1915, 1916	63.4
Danish White.....	12	4	" " " "	65.4
Irish Victor.....	12	4	" " " "	63.6
Lincoln.....	12	4	" " " "	62.9
Minnesota No. 6.....	12	4	" " " "	62.6
Swedish Select.....	12	3	1909, 1910, 1916	63.5
White Bonanza.....	8	3	" " "	60.3
Swedish Select.....	12	3	1911, 1912, 1913	56.2
Siberian.....	6	3	" " "	59.8
Swedish Select.....	12	3	1914, 1915, 1916	56.5
Silvermine (6-403).....	10	3	" " "	61.8
Garton's No. 5.....	10	3	" " "	42.8
Swedish Select.....	8	2	1909, 1910	65.7
Twentieth Century.....	4	2	" "	71.6
Swedish Select.....	8	2	1911, 1912	60.3
Black Gotham.....	4	2	" "	59.5
Swedish Select.....	8	2	1915-1916	61.1
Mammoth Cluster.....	8	2	" "	56.9
Scottish Chief.....	8	2	" "	70.2
Great American.....	8	2	" "	70.8
Big Four.....	8	2	" "	65.7
White Kherson (Iowa 103).....	8	2	" "	68.6
White Russian.....	8	2	" "	50.5
President.....	8	2	" "	57.0
Wisconsin Pedigree No. 1.....	8	2	" "	59.3
Texas Red.....	8	2	" "	58.5
Bryant's Silver Plume.....	8	2	" "	58.0

Northern and Home-Grown Seed Oats.—Many farmers in northern Illinois have made it a practice to obtain their seed oats from the northern states and Canada, maintaining that they are superior to the home-grown oats for seed purposes. In order to establish the relative difference in yield between the two kinds of seed oats, tests were begun in 1908 with oats grown in Canada and with home-grown oats, both kinds in every comparison being of the same variety. The results appear in Table 3.

TABLE 3.—AVERAGE YIELDS OF NORTHERN AND OF HOME-GROWN SEED
OATS AT DEKALB
(Bushels per acre)

Variety	Date	Number of tests each	Yield of northern oats	Yield of home-grown oats
Siberian	1908	6	40.1	37.7
American Banner	1912	2	92.9	77.9
Siberian	1912	4	55.6	60.0
American Banner	1913	2	63.1	61.5
Siberian	1913	2	58.6	63.6
Swedish Select	1914	4 ¹	52.1	47.5
American Banner	1914	2	49.1	43.3
Swedish Select	1915	4	73.1	68.0
American Banner	1915	4	72.8	61.6
American Banner	1916	4	72.1	80.7
Average .....	....	..	61.5	58.5

¹Only two tests were made of Swedish Select, northern-grown, in 1914.

A six-year average, covering 32 tests with northern oats and 34 tests with home-grown oats, shows that the northern-grown seed produced 3.0 bushels more per acre than the home-grown seed. This difference is scarcely large enough to justify the extra expense and

TABLE 4.—AVERAGE YIELDS OF VARIETIES OF SPRING WHEAT GROWN AT DEKALB:
1907-1916
(Bushels per acre)

Variety	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916
Kubanka	12.3	15.8	...	31.9	15.9	6.3	22.2	...	...	...
Saskatchewan Fife .....	...	...	30.3	30.1	15.0	7.1	25.2	24.7	...	...
Minnesota No. 169	17.6	...	28.9	...	...	...	...	...	...	...
Red Fife	16.3	...	...	...	...	...	...	...	...	...
Minnesota No. 163	16.7	...	...	...	...	...	...	...	...	...
Durum .....	...	...	30.3	...	...	...	...	...	...	...
Marquis .....	...	...	...	...	...	...	...	...	30.6	34.7
Blue Stem .....	...	...	...	...	...	...	...	...	19.6	21.3
Alaska .....	...	...	23.0	...	...	...	...	...	...	...

trouble of shipping in the northern seed oats; and in three of the ten comparisons, the home-grown seed produced larger average yields.

Spring Wheat.—To a limited extent, spring wheat takes the place of oats in the rotations on some of the northern Illinois farms. In connection with the work with oats at DeKalb, a few preliminary tests have been made with spring wheat. The yields of the different varieties grown appear in Table 4.

Barley, Rye, and Emmer.—Tests with spring barley at DeKalb have been very limited. Spring rye has been grown for two years, and spring emmer for one year. The results are presented in Table 5.

TABLE 5.—AVERAGE YIELDS OF SPRING BARLEY, RYE, AND EMMER GROWN AT DEKALB
(Bushels per acre)

Variety	1909	1912	1913	1914	1915	1916
Michigan Pedigree barley.....	...	40.1	34.6	43.1	...	...
White Hulless barley ¹	43.9	...	...	...	32.1	42.3
Wisconsin Pedigree barley.....	55.7	57.2
Montana Two-Rowed barley.....	50.0	34.6
Spring rye.....	22.3	19.5
Spring emmer ²	32.0	...

¹For the purpose of comparison, the yields of barley grain are calculated on the basis of 48 pounds to the bushel for unhulled barleys and 40 pounds for hulless barley, the difference of 8 pounds being allowed for hulls. (The customary weight for hulless barley is 60 pounds per bushel.)

²Based on 30 pounds to the bushel (see U. S. Farmers' Bulletin 466, page 12).

CENTRAL ILLINOIS

TESTS AT URBANA, IN CHAMPAIGN COUNTY

Variety trials of spring grains on the Urbana field, reported in this bulletin, were begun in 1903. The results given have been obtained from varieties of spring grains grown in two rotations: (1) corn, corn, oats or other spring grain, and clover; (2) wheat, corn, oats, and clover. The yields are averages obtained from a grain system and a live stock system of farming.

Oats.—The leading varieties of oats are compared, on the percentage basis, with Siberian, a variety which has been in the trials since 1903. This method of tabulation renders it possible to make a direct comparison of a given group of tests. The complete data are reported in Table 6 and a summary is given in Table 7.

Sixty Day, White Bonanza, Siberian, Schoenen, Silvermine, Irish Victor, Swedish Select, and American Banner are the highest yielding varieties of oats tested for central Illinois. These varieties have been grown for six or more years at Urbana. Other promising varieties are Great American, Yellow Kherson (Iowa 105), Big Four, and Wisconsin Pedigree No. 1.

[January,

TABLE 6.—AVERAGE YIELDS OF VARIETIES OF OATS GROWN AT URBANA, AND PERCENTAGE HATING USING SIBERIAN AS A STANDARD: 1903-1916* (Bushels per acre)

Variety	1903	1904	1905	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	Percentage rating
Lincoln	20.0	30.5	63.6	27.2	33.7	39.1	47.5	48.1	70.1	15.6	50.1	...	79.9	91.5
American Banner	24.0	31.4	56.7	34.7	25.3	46.6	56.2	48.5	63.7	32.8	54.2	...	70.5	95.9
White Bonanza	21.9	31.4	75.6	35.5	19.4	47.8	64.4	45.5	77.0	28.5	...	71.6	80.5	108.2
Siberian	26.1	32.9	68.2	33.7	31.7	43.6	58.6	60.5	72.8	24.3	50.4	62.3	71.4	100.0
Twentieth Century	17.9	25.0	53.3	26.2	31.5	41.6	55.9	44.9	72.8	18.0	52.7	...	...	87.5
Irish Victor	28.4	26.4	58.4	31.5	26.9	49.4	63.1	62.1	70.9	...	...	55.1	76.3	497.6
Waverly	12.1	22.5	61.0	...	...	...	...	...	...	...	...	...	...	75.2
Danish White	14.1	28.5	62.9	...	...	41.6	63.1	60.8	72.6	...	...	61.1	60.7	94.5
Black Tartarian	20.7	19.5	...	30.9	16.9	43.7	...	...	...	...	...	60.3	52.9	81.2
Prize Cluster	17.8	16.4	43.5	...	...	...	...	...	...	...	...	...	...	61.1
Black Gotham	21.7	36.2	59.0	30.0	30.6	45.9	62.8	41.8	...	...	...	...	...	92.3
Silvermine	...	25.0	66.1	34.7	25.0	52.2	53.4	...	...	...	...	65.7	71.6	97.8
Schoenen	...	22.5	71.0	28.1	28.4	46.2	68.4	66.7	...	...	...	66.3	62.5	99.4
Sixty Day	...	...	56.9	67.1	48.8	46.6	75.6	49.1	72.4	28.4	51.0	83.6	59.2	110.6
Minnesota No. 6	...	...	...	...	...	...	...	32.5	73.6	...	...	61.3	72.0	94.5
Sixty Day U.S.D.A. No. 26114	...	...	...	...	...	...	60.0	...	...	...	...	...	...	...
Svedish Select	...	...	...	...	...	...	...	58.3	70.8	14.1	54.5	61.6	68.5	...
Bryant's Silver Plume	...	...	...	...	...	...	...	...	79.8	20.8	33.2	67.5	64.2	95.9
Khyson	...	...	...	...	...	...	...	...	...	32.3	41.3	66.9	65.4	101.5
Early Champion	...	...	...	...	...	...	...	...	...	24.3	41.6	66.6	57.8	98.8
Mammoth Cluster	...	...	...	...	...	...	...	...	...	...	...	...	...	91.3
Yellow Kherson (Iowa 165)	...	...	...	...	...	...	...	...	...	28.2	64.5	56.1	56.1	80.8
Garton's No. 5	...	...	...	...	...	...	...	...	...	...	...	70.4	67.5	103.1
Great American	...	...	...	...	...	...	...	...	...	...	...	72.5	49.9	91.5
Wisconsin Pedigree No. 1	...	...	...	...	...	...	...	...	...	...	...	66.7	77.5	107.9
Garton's Victor	...	...	...	...	...	...	...	...	...	...	...	68.4	66.5	101.6
Big Four	...	...	...	...	...	...	...	...	...	...	...	59.0	58.5	87.9
President	...	...	...	...	...	...	...	...	...	...	...	62.0	75.7	103.0
White Kherson (Iowa 103)	...	...	...	...	...	...	...	...	...	...	...	61.7	65.9	95.4
Scottish Chief	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Victory	...	...	...	...	...	...	...	...	...	...	...	...	...	...
White Russian	...	...	...	...	...	...	...	...	...	...	...	...	...	...

*The 1906 yields are omitted because of irregularities in planting.

TABLE 7.—COMPARABLE AVERAGE YIELDS OF VARIETIES OF OATS GROWN AT URBANA
USING SIBERIAN AS A STANDARD: 1903-1916
(Bushels per acre)

Variety	Total number of tests	Number of years compared	Years on which comparison is based	Average yield
Siberian	64	13	1903-1916	49.0
American Banner	34	13	" "	47.0
Siberian	56	12	1903-1914, 1916	47.8
Lincoln	26	12	" " "	43.8
Siberian	62	12	1903-1913, 1915, 1916	48.5
White Bonanza	38	12	" " " "	49.9
Siberian	48	11	1903-1914	45.7
Twentieth Century	18	11	" "	40.0
Siberian	60	11	1903-1912, 1915, 1916	51.1
Irish Victor	30	11	" " " "	49.9
Danish White	30	11	" " " "	48.3
Siberian	62	11	1905-1916	52.5
Sixty Day	44	11	" "	58.1
Siberian	51	9	1904-1911, 1915, 1916	51.4
Schoenen	27	9	" " " "	51.1
Siberian	36	8	1903-1911	44.4
Black Gotham	12	8	" "	41.0
Siberian	35	8	1904-1910, 1915, 1916	50.3
Silvermine	29	8	" " " "	49.2
Siberian	55	8	1907-1912, 1915, 1916	54.3
Minnesota No. 6	27	8	" " " "	51.3
Siberian	27	7	1903, 1904, 1907-1909, 1915, 1916	43.1
Black Tartarian	21	7	" " " " " "	35.0
Siberian	44	6	1911-1916	56.9
Swedish Select	26	6	" "	54.6
Siberian	28	5	1912-1916	56.2
Bryant's Silver Plume	22	5	" "	57.1
Siberian	20	4	1913-1913	52.1
Kherson	20	4	" "	51.5
Early Champion	20	4	" "	47.6
Siberian	3	3	1903-1905	42.4
Waverly	3	3	" "	31.9
Prize Cluster	3	3	" "	25.9
Siberian	18	3	1914-1916	61.4
Mammoth Cluster	18	3	" "	49.6
Siberian	16	2	1915, 1916	66.8
Yellow Kherson (Iowa 105)	16	2	" "	68.9
Garton's No. 5	16	2	" "	61.2
Great American	16	2	" "	72.1
Wisconsin Pedigree No. 1	16	2	" "	67.9
Garton's Victor	16	2	" "	58.7
Big Four	16	2	" "	68.8
President	16	2	" "	63.8
Siberian	8	1	1916	71.4
White Kherson (Iowa 103)	8	1	" "	76.4
Scottish Chief	8	1	" "	77.2
Victory	8	1	" "	75.1
White Russian	8	1	" "	65.7

Spring Wheat.—The Urbana field is considered, ordinarily, outside the spring-wheat belt. Very little attention has therefore been given to spring wheat on that field. However, recent high prices have given considerable impetus to the growing of the crop in central Illinois.

In 1912 a strain of spring wheat which was known as home-grown, was placed in the trials with other spring grains. More recently, three other varieties have been included, none of which has seemed to do better than the type first tried.

TABLE 8.—AVERAGE YIELDS OF VARIETIES OF SPRING WHEAT GROWN AT URBANA: 1912-1916
(Bushels per acre)

Variety	Total number of tests	Number of years compared	1912	1913	1914	1915	1916
Spring, home-grown, S.W.R. ¹ ..	13	5	25.6	17.9	12.8	...	...
Spring, home-grown, N.C.R. ² ..	13	5	24.7	18.2	13.9	19.6	27.9
Durum	4	2	...	...	...	14.4	24.6
Marquis	4	2	...	...	...	14.6	21.3
Red Fife.....	4	2	...	...	...	6.4	18.3

¹Southwest rotation consists of wheat, corn, oats, and clover (or soybeans).

²North-central rotation consists of corn, corn, oats, and clover (or soybeans).

Even tho the data for spring wheat are limited, there are indications that this crop offers possibilities, especially where winter-killing is likely to occur.

Barley.—Only a few of the more important kinds of barley were included in the trials during the earlier years, but for the last two seasons the number has been increased, and in the near future others will be placed in competition with those now on trial. The results to date are meager, but they are presented for the information they convey to growers who wish to diversify their crops.

TABLE 9.—AVERAGE YIELDS OF VARIETIES OF BARLEY GROWN AT URBANA: 1912-1916
(Bushels per acre)

Variety	Total number of tests	Number of years compared	1912	1913	1914	1915	1916
Oderbrueker, S.W.R. ¹	12	5	48.0	17.8	25.3	...	...
Oderbrueker, N.C.R. ²	12	5	...	13.5	26.8	55.2	57.1
Common	10	5	53.8	17.1	24.2	54.9	55.8
Beardless	4	2	...	...	...	44.6	43.7
White Hulless ³	4	2	...	...	...	26.4	40.2
Two-Rowed	3	2	...	...	...	38.2	28.1
Wisconsin Pedigree.....	2	1	...	...	...	...	56.8

¹Southwest rotation consists of wheat, corn, spring cereals, and clover (or soybeans).

²North-central rotation consists of corn, corn, spring cereals, and clover (or soybeans).

³See first footnote to Table 5, page 503.

Common barley has given fair results. It is probably the most promising of the varieties which have been grown for more than two years. Common and Oderbrucker barley are very similar in their characteristics.

SOUTHERN ILLINOIS

TESTS AT FAIRFIELD, IN WAYNE COUNTY

At Fairfield, the crop field representing the southern part of the state, the work with oats has been incidental and limited because this crop has been grown to replace winter wheat when it failed. In 1909 all of the winter wheat was replaced, and in 1915 a few varieties of winter wheat were replaced by oats, barley, and spring wheat. Climatically, southern Illinois is not considered well adapted to the growing of spring grains, altho in favorable seasons, as in 1909, fair yields may be secured. The results which were obtained in 1909 and 1915 are given in Table 10.

TABLE 10.—AVERAGE YIELDS OF SPRING GRAINS GROWN AT FAIRFIELD
(Bushels per acre)

Variety	1909	1915
Texas Red oats.....	60.1	34.1
Sixty Day oats.....	50.1	24.5
Early Champion oats.....	48.9	27.3
White Bonanza oats.....	35.4	34.5
Swedish Select oats.....	43.4	...
Silvermine oats.....	41.0	...
Yellow Kherson (Iowa 105) oats.....	...	30.6
Great American oats.....	...	25.4
Manschuri barley.....	19.1	...
Montana Two-Rowed barley.....	...	3.0
Spring rye.....	...	5.0
Marquis spring wheat.....	...	0.0

CHARACTERISTICS OF DIFFERENT VARIETIES OF OATS

The adaptability of a variety of oats to a given section of the state is often determined by the time of its maturity, and its adaptability to a particular purpose by the color of the kernel, white oats usually bringing more on the market than yellow or dark-colored grains. It is important, also, to know something of the amount of foliage, especially if clover is to be seeded with the oats. Sixty Day oats do not produce relatively as large a quantity of foliage as other types, and it has been observed that clover does much better when planted with this variety than when seeded with a variety such as Swedish Select, which has an abundance of foliage. Table 11 has therefore been compiled in order to give the reader a clear idea of the important characteristics of the different varieties of oats concerning which data have been presented in the preceding pages.

TABLE 11.—CHARACTERISTICS OF VARIETIES OF OATS TESTED AT DEKALB, URBANA, AND FAIRFIELD

Variety	Maturity	Color of kernel	Foliage	Form of head	Height
American Banner.....	Medium late	White	Medium	Open	Tall
Big Four.....	Medium late	White	Medium	Open	Medium
Black Gotham.....	Medium late	Black	Rather heavy	Open	Tall
Black Tartarian.....	Late	Black	Rather heavy	Open	Tall
Bryant's Silver Plume.....	Medium late	White	Medium	Side	Medium
Danish White.....	Medium late	White	Medium	Open	Tall
Early Champion.....	Early	White	Light	Open	Short
Garton's No. 5.....	Medium late	White	Heavy	Open	Tall
Garton's Victor.....	Late	Black	Heavy	Open	Tall
Great American.....	Medium late	White	Medium	Open	Medium
Hvilling.....	Medium late	White	Medium	Open	Tall
Irish Victor.....	Medium late	White	Light	Open	Tall
Kherson.....	Early	White	Rather light	Open	Short
Lincoln.....	Medium late	Yellowish	Medium	Open	Tall
Mammoth Cluster.....	Medium late	White	Medium to heavy	Side	Rather tall
Minnesota No. 6.....	Medium late	White	Medium	Open	Rather tall
President.....	Medium late	White	Heavy	Open	Rather tall
Scottish Chief.....	Medium late	White	Medium	Open	Tall
Schoenen.....	Medium late	White	Medium	Open	Tall
Siberian.....	Medium late	White	Medium	Open	Tall
Silvermine.....	Medium late	White	Medium	Open	Tall
Sixty Day.....	Early	Yellow	Light	Open	Short
Swedish Select.....	Medium late	White	Medium	Open	Tall
Texas Red.....	Medium late	Reddish	Rather heavy	Open	Medium
Twentieth Century.....	Medium late	White	Medium	Open	Tall
Victory.....	Medium late	White	Medium	Open	Tall
White Bonanza.....	Medium late	White	Medium	Open	Short
White Kherson (Iowa 103).....	Early	White	Light	Open	Tall
White Russian.....	Late	White	Heavy	Side	Short
Wisconsin Pedigree No. 1.....	Medium late	White	Medium	Open	Tall
Yellow Kherson (Iowa 105).....	Early	Yellow	Light	Open	Short

